



# STORMWATER POLLUTION PREVENTION *For Sports Facilities*

pacific northwest  
POLLUTION PREVENTION  
resource center



## BEST MANAGEMENT PRACTICES (BMPs)

### Topic 4: Snow and Ice Management

#### TABLE OF CONTENTS

- Introduction*
- Chemical P2  
Facility*
- Equipment & Maintenance*
- References*



#### INTRODUCTION

Snow and ice management activities can contribute to stormwater pollution and impact surrounding landscaping due to specific ingredients in chemical de-icers, sediment collection in snow piles, and use of snow removal equipment.

Keeping icy parking lots and pedestrian walkways safe is important for sports facilities and their staff and visitors/fans. Most road or parking lot de-icing is accomplished by mechanical methods (scraping, pushing or plowing) or by applying chemicals and/or sand as an abrasive. Chemical de-icing is most commonly used for walkways.

Chemical de-icers depress the freezing temperature of water and chemically turn ice back into water, improving vehicle and pedestrian safety. Traditionally, many chemical de-icers have been chloride-based salts (often referred to as “road salt”). These chemicals runoff as stormwater with the snow and ice melt and resist break down in the environment. Chlorides are corrosive to metal structures, especially aluminum, and vehicles. Sand contributes to sediment and solids content in stormwater and, if excessively applied, can clog storm drains.

Presented below are source reduction opportunities *that can minimize or prevent stormwater pollutants from reaching surface waters as a result of snow and ice management.*

## STORMWATER SOURCE REDUCTION

### Chemical P2

- **Be proactive – Anti-Ice.** De-icing is removal of [snow](#), [ice](#) or [frost](#) from a surface. **Anti-icing** is application of specific chemicals prior to snow or ice formation, supplementing the de-icing process by delaying or preventing the bond of ice and snow to the pavement, making mechanical removal easier. Anti-icing can reduce the amount of de-icing chemicals, sand, or equipment needed.
- **Apply the least amount** of chemicals necessary to melt the ice, following manufacturer instructions. Do not overspread, or under-dilute when mixing is required. Excessive application of deicers does not improve effectiveness. Instead, over-application wastes materials and releases unnecessary chemicals
- **Use alternatives to salts when possible.** Try to minimize chloride-based de-icing products, or use those with lower percentage of chlorides, suited to temperatures and conditions. In some cases, relying on a single substitute for chloride won't work. Using sand, for example, can improve traction but fails to offer the same deicing or anti-icing properties as chemicals. Other chemicals are effective at varying temperatures and therefore may not work in very cold conditions. For instance, calcium magnesium acetate (CMA) is a less environmentally harmful chemical than chloride, but CMA has diminished effectiveness below about 15 dF. Road salt (chloride-based) is more effective at temperatures around 15 degrees Fahrenheit (dF) or lower. The University of [Michigan's Occupational Safety & Environmental Health Department](#) provides guidance on when to use different types of chemical products (1).
- Avoid chemical ingredients in de-icers that may be regulated stormwater pollutants in your area, such as phosphorus and zinc.

#### Safer De-Icing Alternatives

- [Pacific Northwest Snow Fighters Specification and Qualified Products List \(QPL\)](#) – Approved products must meet specifications limiting the amount of certain heavy metals and other environmental pollutants.
- [US EPA's Design for Environment \(DfE\) Program Recognition](#) – Any products listed here have gone through a third-party chemical profiling of all formulation ingredients.
- [U.S. Department of Agriculture \(USDA\) Biobased Product Certification Catalog](#) – Snow and ice control products containing at least 93% bio-based content.

*DISCLAIMER: Neither PPRC nor GSA endorses or guarantees performance of any of the products referenced here.*

### **Facility**

- Sweep uncovered lots before the snow and ice season to minimize sediment and particles that will runoff with snow/ice melt.
- For smaller events when all parking areas or sidewalks are not needed, block off areas so they do not have to be treated.
- Pile shoveled snow where it can be absorbed into the ground, not on the street or lots.
- Inspect storm drains and catch basins after major melts. Clean as necessary.
- Inspect uncovered lots after snow melt to determine if sweeping is necessary.

### **Equipment & Maintenance**

- If snow removal and de-icing is contracted, specify the vendor use [Center for Environmentally Sustainable Transportation in Cold Climates \(CESTCC\)](#) “smart snowplows,” which use sensors to gauge an appropriate level of chemical application (2). According to CESTCC, “Ordinary snowplows have at least one sensor to measure pavement temperature. Smart snowplows not only read temperature but also residual salt from previous applications, the presence of ice and the amount of friction on the road. All of these readings help operators apply less salt.”
- Maintain snow and ice management equipment to ensure there are no oil or fluid leaks and they are calibrated to spread an exact amount of de-icing chemical for the conditions specified.
- Institute anti-idling policies for staff and contractors when equipment is not directly in use.
- Use proper containment and spill prevention during transfer of de-icing chemicals to spreading equipment.

## **REFERENCES & ADDITIONAL READING**

1. University of Michigan. Department of Occupational Safety and Environmental Health. Environmental <http://www.oseh.umich.edu/environment/wintermaint.shtml>
2. Phillips, R. Green highway snow and ice control cuts the chemicals. *Washington State University News* [Online] November 17, 2014. <https://news.wsu.edu/2014/11/19/green-highway-snow-and-ice-control-cuts-the-chemicals/#.VKGztcP1YA>
3. Vox. How America got addicted to road salt — and why it's a problem. *Vox*. <http://www.vox.com/2015/1/13/7531833/road-salt-environment-alternatives> (accessed Feb 2, 2015).